bright as it should be for it to be possible to obtain any image of the corona. To these points Dr. Huggins has replied in the *Observatory* for November. Dr. Huggins states that he has had no difficulty at all in photographing the moon in full sunshine, and that the observations of Prof. Langley and others of Mercury and Venus, which have been seen as black disks before they reach the sun, proves that the corona must have a sensible brightness as compared with the atmospheric illumination.

He also points out that Mr. Pickering fails to obtain any trace on his photographs even of the defects of his own instrument. Dr. Huggins declines further discussion, preferring to wait the result of the work now being carried on by Mr. Ray Woods at the Cape Observatory. Mr. Pickering replies in *Science* for October 23, admitting the possibility of photographing the moon in full sunshine, but contending that these very photographs of the moon supply an additional proof of his opinion that the light of the atmosphere near the sun is more than 300 times too intense for it to be possible to obtain a photograph of the corona, since the sky light near the sun was fifty times as bright as that near the moon, and coronal photographs, to be of any use, should be able to record differences of illumination of only one-tenth the brightness of the full moon.

He explains the visibility of Venus and Mercury as being caused by the refraction of the sun's light through their atmospheres, the black disk being thus surrounded by a narrow luminous ring.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, NOVEMBER 15-21

(For the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on November 15

Sun rises, 7h. 21m.; souths, 11h. 44m. 48·4s.; sets, 16h. 9m.; decl. on meridian, 18° 37′ S.: Sidereal Time at Sunset, 19h. 49m.

Moon (one day after First Quarter) rises, 13h. 18m.; souths, 18h. 37m.; sets, 0h. 3m.*; decl. on meridian, 8° 43′ S.

Planet	Rises	Souths	Sets	Decl. on meridian
	h. m.	h. m.	h. m.	° ′
Mercury	... 9 6	... 12 54	.. 16 42	... 24 8 S.
Venus	... 11 28	... 15 2	... 18 36	... 25 59 S.
Mars	... 23 40*	... 6 46	... 13 52	... 12 2 N.
Jupiter	... 2 14	... 8 23	... 14 32	... 1 5 N.
Saturn	... 18 48*	... 2 56	... 11 4	... 22 20 N.

* Indicates that the rising is that of the preceding and the setting that of the following day.

Occultation of Star by the Moon

Nov.	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
			h. m.	h. m.	° °
17	... B.A.C. 8365	... 6½	... 22 41	... 23 44	... 166 298

Phenomena of Jupiter's Satellites

Nov.	h. m.		Nov.	h. m	
15	... 5 0	IV. occ. reap.	17	... 4 35	II. tr. ing.
16	... 2 45	III. ecl. disap.	20	... 6 56	I. tr. ing.
16	... 5 51	III. ecl. reap.	21	... 3 16	I. ecl. disap.
16	... 6 47	III. occ. disap.	21	... 6 34	I. occ. reap.

The Occultations of Stars and Phenomena of Jupiter's Satellites are such as are visible at Greenwich.

GEOGRAPHICAL NOTES

The last number of the *Izvestia* of the Russian Geographical Society (xxi. 3) contains a variety of interesting papers. M. Ivanoff describes some Turkestan antiquities: namely, the Akhyr-tash, situated at the foot of the Alexander ridge, twenty-seven miles from Aulie-ata, one of the grandest buildings of antiquity, which covers nearly 20,900 square yards, and must have been some projected immense temple or palace; it was built from immense stones, weighing about one ton each, and brought from Tash-tube. M. Ivanoff gives for the first time a plan and a detailed description of the ruins of this immense building. Stone idols on the Issyk-kul, as also a burial-ground on the shores of the same lake, are described and represented by drawings. The whole is a most valuable contribution M. Trusman's paper on Finnish elements in the Gdov district of St. Petersburg will be welcome to Russian archæologists. Capt. Gedeonoff gives a list of forty-three places in the Transcaspian region, whose positions have been determined by means of astronomical observations, as also their heights, determined by barometrical measurements. We notice the following: Khiva (house of Mat-murat), 41° 23′ 0″·1 N. lat., 60° 22′ 18″·9 E. long., 351 feet above the sea-level; Merv (Koushut-khan-kala), 37° 35′ 37″·6 N. lat., 61° 50′ 27″·9 E. long., 565 feet; and Tchardjui, 39° 1′ 33″·8 N. lat., 63° 36′ 12″·9 E. long., 433 feet. M. Konshin's paper on the Sary-kamysh lake basin and the western basin deserves more than a short notice, as it sums up the latest researches in this region, and presents the whole question as to the bed of the Amu-daria in quite a new light. A report on cartographical work in Russia in 1884 will be summed up under a separate head, as also two letters from Col. Prjevalsky and M. Potanin. Finally, the same issue contains two most valuable maps, by Gen. Tillo. One of them, on a larger scale, gives the lines of equal magnetic intensity, full and horizontal only, for Russia in Europe, reduced to the year 1880. On this map all places where observations have been made, as also where anomalies have been observed, are marked. Two other maps, on a smaller scale, give the lines of equal secular variation, both of the horizontal and of the total magnetical intensity. All three have explanations in German. These maps thus complete the remarkable work on "Earth-Magnetism in Russia," undertaken a few years since by M. Tillo, and already mentioned in Nature.

The last news from M. Potanin's expedition is embodied in a letter, dated San-chuan, January 25, and published in the last issue of the St. Petersburg *Izvestia* (xxi. 3). Leaving San-chuan on November 14, M. Potanin followed the right bank of the Hoang-ho up to He-cheu. The same red sandstones and conglomerates, covered with loess, were met with; the ridge which separates the Hoang-ho from the Tao-ho, intersected by deep ravines, is all covered with cornfields and villages; the soil abounding with moisture, villages are situated as high as 2000 feet above the bottom of the valleys. Crossing the Tao-ho and next the Da-sya-ho, the little half-ruined town of He-cheu was reached. The Da-sya-ho River is formed by the junction of three rivers—the Huishu, the Tumun, and the Leu-guan—situated 70 li above the town. This last river was followed by the expedition, and its source was reached after a two days' march. Its valley is wide and well-peopled in its lower half, the upper one being a mere gorge thickly covered with brushwood, and quite unpeopled. Crossing a ridge at the sources of the Leu-guan and its tributary, Urunka, the broad valley of the Tchitai was next reached. Its banks consist also of sandstones and conglomerates, and it is thickly peopled with Salars, its upper part being occupied by Tanguts. Descending this valley, a two days' march brought the expedition to the confluence of the Tchitai with the Yellow River; and another two days' march brought them to San-chuan. On this stretch the Yellow River flows in a narrow gorge between steep crags of the red sandstones and conglomerates, and the road ascends these crags or follows their slope on narrow wooden balconies, or by flights of steps cut in the hard rock. The right bank of the river is inhabited by Salars. They have maintained their Turkish language in great purity. The men wear a Chinese dress, but the women wear broad trousers, and a broad overcoat with sleeves, and a pointed bonnet which covers the upper part of the back. They are all Mussulmans, but their mosques are of Chinese architecture, and are decorated with dragons, lions, and tigers. Above its gorge the Yellow River flows through a depression seven miles long and less than two miles wide, which has received the name of San-tchuan, or Gurban-tala, and is peopled exclusively by Mongolian Shirongols. Their central village is Ni-ja. The Shirongols seem to belong to the same stem as that described by M. Prjevalsky under the name of Dalda in the vicinity of Kuku-nor. Both are called Tu-jen by the Chinese. If this supposition is correct, they would appear to occupy the territory from the longitude of He-cheu to that of Gan-cheu. They speak Mongolian, with an addition of Chinese words, but have some words of their own which must be remains of the language they have spoken in their former territory, the Urdus. Their dress is Chinese, but the women have maintained the same trousers as the Salars, and their houses have much likeness with those of these last. They live

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on agriculture and gardening. All the religions of the region are met with among them. Around He-cheu they are all Mussulmans; but families having several male children send one of them to a Lamaite monastery so as not to divide their landholdings too greatly, and so a class of Buddhist Lamas has arisen. Those who have received Chinese instruction follow the teachings of Confucius, while the remainder go indifferently to Buddhist or Chinese temples, and many have Shamanist divinities. As to M. Berezovsky, he has left the expedition and has taken another route, *viâ* Hoy-syan; he proposes to rejoin MM. Potanin and Skassi on their way to the south.

THE expedition which is reported to have been massacred in New Guinea was sent out by the Geographical Society of Australasia, founded in May 1883. The commander, Capt. Henry Charles Everill, had been selected from a number of candidates, and his staff included a naturalist, a surgeon, two sub-leaders, one on land and the other on sea, a photographer, three natural history collectors, a surveyor, an engineer, and a "general utility" volunteer. Very full instructions were drawn out for the expedition, while considerable discretion was left to the leader to adapt his operations to circumstances. The instructions included directions not only for surveying work, but for observations on the natives, on zoology, botany, and geology, with directions for the collection and preservation of specimens. The expedition was to enter the Aird River, which is probably only an east arm of the Fly River. As a matter of fact, a telegram of September 22 announced the arrival of the *Bonito* (the vessel in which the expedition sailed from Sydney) in the Fly River. It was to penetrate as far as possible into the interior. The Australasian Society contributed 500*l*. to the expedition of Mr. H. O. Forbes, who, according to latest news, was at Port Moresby preparing to penetrate into the interior. Happily the report of the massacre is discredited by the British resident on Thursday Island.

THE Geographical Society of Lisbon passed a resolution at its last meeting asking the Portuguese Government to make a money grant by way of remuneration to the explorers MM. Capello and Ivens, and to pay the cost of publishing not less than 5000 copies of the account of their journey. It was also resolved to address every commercial association throughout the country pointing out the necessity of establishing a company or society for the purpose of investigating colonial markets hitherto imperfectly known, but of which MM. Capello and Ivens are showing the importance.

AT the last meeting of the Paris Society of Commercial Geography on the 20th ult., the Burmese Envoy being present, M. Bran de Saint Pol Lias described his recent journeys in Indo-China, which appear not to have extended far beyond Saigon, Cambodia, and the delta of the Red River. Indeed, travel even in these comparatively frequented parts of the peninsula must have been difficult when the traveller was there, for the greater part of Tonquin and Cambodia was in rebellion at the time of his visit.

THE *Bulletin* (2e trimestre, 1885) of the Paris Geographical Society, just published, contains a long report on the labours of the society, and on the progress of the geographical sciences, by M. Maunoir, the secretary. The work is, as usual, well and thoroughly done. The only other paper in the number is a description of the regions of Algeria traversed by the meridian of Paris, by Commander Derrien. This is accompanied by a map, and describes in succession, and with great detail, their orography, hydrography, geology, military roads, meteorology, military and administrative divisions, and also discusses the origin of the tribes of the Jebel Amour.

THE Geographical Society of Tokio appears to be steadily pursuing its work. The recent numbers of its *Journal*, which we have before us, show much activity in regions around Japan. Amongst the papers in the sixth volume we notice the following:—The five races of the Chinese Empire, and their ancient progress, by Mr. Otori; the interior of Northern Corea, by Mr. Kaizu; travels in Siam; notes on Thibet (compiled from European sources); Formosa under the Chinese; Manchuria: recent events in Annam; travels in South-eastern Russia; the salt-tax in China; colonisation in Saghalien (a review); Formosa during the Dutch occupation; historical notes on the relations between Russia and China; notes on the aboriginal language of Formosa, with a considerable vocabulary; Candahar and the Lower Cabul Valley, with a sketch map; the mines of Central Japan, with a map, and various other minor communications. The first number of the tenth volume contains a paper by Mr. Akamatsu on the origin and condition of the Chinese emigrants to the Philippines, based apparently on the writings of Prof. Blumentritt on the subject; and one on the longitude of Japan, by Mr. Arai, the head of the meteorological bureau. The *Journal* is printed in Japanese, but a short table of contents is appended in English.

THE leading paper in the current number (Heft 3, Band viii.) of the *Deutsche Geographische Blätter*, the organ of the Geographical Society of Bremen, is one by Leonard Steineger, describing a voyage around Behring Island, off the coast of Kamchatka, in the autumn of 1882. It describes at some length the incidents of the voyage, the capabilities of the island, &c. The writer visited and describes the ruins of the hut in which Behring and his companions wintered 141 years previously, and where the traveller himself died, and was buried. Dr. von Steiner compiles from Mr. Im Thurn, an account of the Indians of Guiana. The usual geographical news concludes the number.

MR. SCOTT, of the Indian Survey Department, recently delivered a lecture at Calcutta on the transfrontier surveys of India, in which he pointed out that 20,000 square miles on the immediate north-western frontier needed exploration. Here lie the Kafila routes into Afghanistan, which he much regretted had not been used for the advance into Afghanistan instead of the hot and thirsty Bolan Pass. He suggested that the rules against British officers crossing the frontier should be relaxed, and that they should be permitted to accept invitations, with a guarantee of safety, by native officers to their homes across the border.

THE death of Col. Obligado, of the Argentine Army, on September 22 at Buenos Ayres is announced. In recent years he had made many scientific explorations on the coasts and in the interior of Patagonia. He traversed the forests in the basins of the Negro, Limay, and Nanquen rivers, which had never been explored before; and several places in these regions now bear his name. His death was due to ill-health, caused by his journeys in Patagonia.

THE last issue of the *Mittheilungen* of the Geographical Society of Vienna contains two papers on the Carolines; one by Prof. Blumentritt describing the historical relations of Spain to the archipelago. He makes more interesting quotations from books used in Spanish schools, in which the Carolines are mentioned amongst the colonies of Spain, and the usual elementary school-book information is given about them. The secretary to the Society also gives a map of the group, with much geographical and other information respecting them. Herr Jülg concludes his paper on the erosive action of the sea, and the usual current geographical information brings the number (Band xxviii., No. 10) to a conclusion.

THE SCOTTISH METEOROLOGICAL SOCIETY

AT a meeting of the Directors of the Ben Nevis Observatory held on October 30, it was intimated that during the summer Prof. Ewing, of Dundee, had visited the Observatory to make arrangements for the observations on earthquakes and earth movements which it had been resolved to carry on there. Prof. Vernon Harcourt and Mr. Harold Dickson, both of Oxford, also spent some time at the Observatory conducting experiments and observations on the intensity of light in flames, it being necessary, in connection with the important practical question of a satisfactory determination of the light-giving qualities of coal gas supplied to the public, to make experiments on such a situation as Ben Nevis, where barometric pressure is low. Mr. H. N. Dickson resided two months at the Observatory, being chiefly engaged in carrying out, under the superintendence of Prof. Tait and Mr. Buchan, a valuable series of observations and experiments on the methods of observing the temperature and humidity of the air. For this purpose the season was a singularly suitable one, on account of the extremes of temperatures and humidities the weather presented during the summer on the Ben. As regards the humidity, where there were of course abundant opportunities of studying the behaviour of the instruments in an atmosphere completely saturated through a wide range of temperature, many cases occurred of excessive and protracted dryness of the atmosphere. On one occasion, in September, no deposition of dew took place on

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